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Undergraduate Dissertation

Translation of the Maintenance Manual for the Loader LiuGong CLG950E

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A mis padres, Ana y Miguel, por estar siempre ahí,
ayudándome y guiándome.
A Jorge, por quererme tal y como soy desde siempre.
Sois lo mejor que tengo, no podría pedir mejor compañía
para este viaje al que llamamos vida.
Sin vosotros, nada de esto habría sido posible

Summary:

This dissertation contains a translation of an extract from the technical manual *Maintenance Manual CLG950E,* published by the brand LiuGong in 2019. This text was translated with the purpose of showing the possible problems resulting from a second translation. That is, the manual was firstly written in Chinese and it was firstly translated into English, but now then it was translated from English into Spanish and this involved that some of the details and meanings might be lost. The text was translated in order to point out the possible difficulties that can be found during the process of translation of a text of these characteristics and how these difficulties can be solved in a successful way. Added to that, there is also a critical implication on how some brands do not commission an original translation for each of their manuals and uses different parts from other manuals to complete their translations. The dissertation also provides some suggestions on how to overcome these problems.

Finally, the text discusses which are the best strategies to follow during the translation process of a technical manual, providing a glossary of technical terminology that can be useful in the translation of similar texts.

Resumen:

Este Trabajo de Fin de Grado contiene una traducción de un extracto del manual técnico *Manual de mantenimiento CLG950E,* publicado por la marca LiuGong en 2019. Esta traducción se ha realizado con el fin de mostrar los posibles problemas derivados de una segunda traducción. Es decir, el manual se escribió primero en chino y se tradujo al inglés, para después traducirlo del inglés al español, lo cual conlleva la posible pérdida de algunos detalles y significados. La traducción se ha realizado con el fin de señalar las posibles dificultades que se pueden encontrar durante el proceso de traducción de un texto de estas características y cómo se pueden resolver estas dificultades de forma satisfactoria.

Además, también se hace una crítica sobre cómo algunas marcas no realizan una traducción original para cada uno de sus manuales y utilizan diferentes partes de otros manuales para completar sus traducciones. El Trabajo de Fin de Grado también ofrece algunas sugerencias sobre cómo superar estos problemas.

Por último, en el trabajo se comentan cuáles son las mejores estrategias durante el proceso de traducción de un manual técnico, proporcionando un glosario de terminología técnica que puede ser útil en la traducción de textos similares.

Glossary:

1. Introduction:

The general thought is that the translation process mainly consists in saying the exact same words of one language into another. In fact, the Cambridge Dictionary of English defines “translate” as “to change words into a different language” (Cambridge, 2021). From this definition, it can be interpreted that the process of translation is simple and can be done by anyone who is proficient in two languages, without having much knowledge on how to properly translate. It may even bring up the idea that a developed AI (Artificial Intelligence) could be able to do the job of a professional translator perfectly. Nevertheless, the translation process goes much further than only putting words from one language into another. In this introduction, I will discuss the labour of the translator, focusing specifically on the translation of technical texts. To achieve this, I will use the book *Technical translation. Usability strategies for translating technical documentation* written by Jodie Byrne in 2006.

It is the labour of the translator to fit the conventions of the various genres of the texts that are going to be translated, not only in the language of origin, but also in the target language. Added to the understanding of the genre, the text must retain all the information from the original one. More concretely, Vermeer states that "the translation must be coherent or, at least, be part of the receiver’s situation" (Reiss and Vermeer, 1984:113, in Byrne 2006:8). Taking this into account, the content must be fully understandable by the receivers in their native language, and this includes the fact that the text must follow the conventions of the genres in the target language. For instance, the translation of a cooking recipe must list the ingredients in the measuring system of the country of the target language. In the case of the text translated for the purpose of this dissertation, it belongs to the genre of technical translation, more concretely to the genre of instructions and manuals.

Technical translation has been mistaken to be part of the genre of scientific or biomedical texts, but contrary to what many people may suppose this genre is connected with technological devices. It deals with the instructions, manuals and information of devices used as tools by people from diverse specialties. Even if it can be related with science or medicine through the use of the technology in these areas, technical translation is considerably broader than that. It represents 90% of the total number of translations made globally (Kingscott 2002:247, in Byrne, 2006:2). This is partly due to the legislation of the European Union, which by the Council of the European Union Resolution C 411 (1998), stated that it is compulsory to translate the product labels and instructions to the official languages of the state where the product is going to be sold (Byrne, 2006). Even if this type of translation may seem plain and simple, as Byrne (2006:12) suggests, the principal challenge of technical translation is to retain the relevant information and can be used easily and efficiently. This means that adapting to the specific vocabulary and the genre is crucial, as a mistake can cause severe problems in the usage of the product. If the instructions of a product are not clear, the product can be misused dangerously and the user can suffer an accident.

Taking into account what has been said formerly, the translation of a technical text must also be considered an opportunity to examine how the genre evolves and adapts to technology. In the case of the text further down, an added circumstance has to be studied simultaneously with the specialized vocabulary that is part of it. This circumstance is that, because of the process of globalization, it has been already translated from Chinese to English before being translated into Spanish.

Globalization nowadays affects many areas. This process consists on the interaction between separate countries regarding the production of goods. It has even affected the field of mechanics. Despite the fact that the United States of America and Germany had

risen as the leading producers of equipment designed for public work in Europe, in the past few years China has started to manufacture this machinery as well. This has generated a new problem regarding the translation of technical manuals, since these manuals are initially written in Chinese and then translated to English, while in the past most manuals were firstly written in English. It must equally be taken into account that some businesses are unwilling to pay for the services of a professional translator for each of its manuals. Because of this, some of these manuals are "translated" extracting the pieces of other manuals that have already been translated and putting them together. This generates a problem when it comes to a third-language translation or even when it comes to understanding the instructions provided in the manual.

The main aim of this dissertation is to highlight and study these new problems that have emerged from the translation of technical texts from Chinese to English and then to Spanish, and to try to propose a solution that is as accurate as possible. To achieve this, I will firstly provide a possible translation that follows the conventions of the genre. This translation is extracted from the technical manual *Maintenance Manual CLG950E,* which was published in 2019 by the machinery brand LiuGong. The extract from this manual that was chosen to be translated is the Maintenance Guide, which is a part that explains the protocols that must be followed by the workshop delegated by the official service of the brand. The reasons for choosing this part were mainly that it is a part of the manual that it is more likely to be distributed between different workshops in the Spanish territory, and that it is an isolated part which is limited in space. The fact that it is a limited part avoids the need of a deeper context from other parts of the text that go directly before or after it.

After the translation provided, I will comment on the strategies that were used to translate the text. Added to that, I will provide a glossary of technical terminology in order to

clarify the specific vocabulary that is found in the text. Finally, I will comment on the difficulties that I encountered regarding the original text. To sum up, this dissertation will try to analyse the problems in a genre that has not received as much attention as it should, because its importance in society is notable. In addition, it will reflect how the constant changes in the modern world affect also this type of translations, that were at all times considered to be plain and rigid.

2. Documentation Plan:

The first step to make a good translation is to read and understand the text and its context. The second step is to correctly document yourself. In this section, I will explain the documentation plan that was carried out in order to understand the conventions of the genre of the text to be translated. Also, I will briefly comment on other texts that have been useful to translate the text and comment its difficulties and problems.

To begin with, I had to do research on the specific genre and its limitations. In order to do this, I used the book by Jody Byrne, *Technical Translation: Usability Strategies for Translating Technical Documentation* (2006). In addition to this text, I have used two manuals to understand the conventions of the genre from Caterpillar and Komatsu. Caterpillar is a company that was originally set in the U.S., while Komatsu was firstly based in Japan. I chose these two brands because I think that their translated manuals are representative of the genre of instruction manuals for public works machinery. Also, Caterpillar was the first brand to introduce hydraulic systems and excavators and thus, the first translated manual of these types of machines belongs to them. The two manuals chosen were the *Caterpillar Performance Handbook* (Caterpillar, 2006) and *Manual de Operación y Mantenimiento* (Komatsu, 2008).

Added to the manuals that have served as parallel texts as well as a way to investigate the conventions of the genre, I have also found useful the book *Introducción a la Traductología* (Vázquez-Ayora, 1977) and the journal *Translation Techniques Revisited: A Dynamic and Functionalist Approach* (Molina & Hurtado Albir, 2001). I have used them in order to get a sense of the existing translation techniques, so as to be able to comment on them after the translation of the text.

Furthermore, I have used mainly online resources to find the correct equivalences for the technical terminology that is part of the text to be translated. These resources have been

the IATE (European Parliament, 2021), which is a website that allows translators to search for vocabulary that has been translated in official texts and the Collins Online Dictionary (European Parliament, 2021), which is the online source of the notable Collins Dictionary.

3. Text translation:

129 August 14, 2019 Maintenance Manual CLG950E Maintenance Guidance	129 14 de agosto de 2019. Manual de mantenimiento CLG950E Guía de mantenimiento.
Maintenance Manual	**Manual de mantenimiento:**
CAUTION! **Perform the maintenance procedures at the intervals according to this manual. Proper maintenance will extend the service life of the machine and provide safer operation.**	**ADVERTENCIA** **Realice el mantenimiento de la máquina tal y como se indica en este manual. El correcto mantenimiento permitirá alargar la vida útil de la máquina y proporcionará un uso más seguro.**
Maintenance Guidance:	**Guía de mantenimiento:**
Correct Maintenance Procedures Learn how to maintain your machine correctly. Follow the instructions of this manual, if your machine has troubles, you must maintain or contact your dealer before operating.	**Correcto mantenimiento** Para aprender cómo realizar el correcto mantenimiento de la máquina, siga las instrucciones de este manual. Si su máquina da problemas, contacte con su proveedor antes de operar con ella.
Daily Checks 1. Check the gauges. 2. Check the coolant, DEF, fuel and oil level. 3. Check hoses and tubes for leakage, wear conditions and damage. 4. Perform a walk-around inspection of the machine. 5. Check for loose or missing parts.	**Comprobaciones diarias** 1. Compruebe los sensores. 2. Compruebe los niveles de líquido refrigerante, AdBlue, combustible y aceite. 3. Compruebe que los tubos y mangueras no goteen, no estén desgastados ni dañados. 4. Realice una inspección visual de la máquina. 5. Compruebe que no falten piezas o que estén sueltas.

Check Service Hour Meter The service hour meter determines when your machine needs to be maintained. The time in the maintenance table is basically given for normal operation. If the machine is operated in severe conditions, you must maintain the machine more frequently.	**Comprobación del horómetro de servicio** El horómetro de servicio indica cuándo se debe realizar el mantenimiento de la máquina. El programa indicado en la tabla de mantenimiento es orientativo y está adaptado a condiciones normales de uso. Si la máquina es sometida a condiciones extremas, se debe realizar el mantenimiento más a menudo.
Maintain Machine on Schedule	**Realice el mantenimiento de la máquina siempre dentro del programa indicado en la tabla de mantenimiento**
Follow the maintenance methods listed in this maintenance manual.	Siga los métodos enumerados en este manual.
Maintenance Suggestions 1. Use only recommended, DEF, fuels and lubricants. 2. Don't adjust the engine speed setting and/or the hydraulic safety valve. 3. Protect electronic units from water and vapor. 4. Do not disassemble electronic units such as sensors etc. 5. Use only recommended LiuGong parts.	**Sugerencias de mantenimiento** 1. Use solo los AdBlue, combustibles y lubricantes recomendados. 2. No ajuste la velocidad predeterminada del motor ni la válvula de seguridad hidráulica. 3. Proteja los dispositivos electrónicos del agua y el vapor. 4. No desmonte los dispositivos electrónicos tales como sensores, etc. 5. Use solo los repuestos recomendados por LiuGong.
Cleanser of Windshield Clean the windshield with special windshield cleanser and ensure no foreign matter mixes with cleanser.	**Limpieza del parabrisas** Limpie el parabrisas con producto de limpieza y asegúrese de que no se mezcle materia extraña con el producto. **Limpieza del aceite de motor** Use aceite de motor nuevo y manténgalo

Clean Engine Oil Use clean engine oil and keep the engine oil clean. Ensure no foreign matter mixes with the engine oil. **Check Discharged Oil or Used Filter Element** After replacing the oil or filter element, check the discharged oil or filter element for iron particles and foreign matter. If any iron particles or foreign matter is found, report this immediately and take preventive measures.	limpio. Asegúrese de que no se mezcle materia extraña con el aceite. **Revisión del aceite de motor viejo y el filtro usado** Tras cambiar el aceite o el filtro, revise el aceite viejo o el filtro retirado en busca de partículas de hierro o materia extraña. Si encontrase algún tipo de materia extraña, informe inmediatamente de ello y tome medidas preventivas.
Welding Cautions 1. Turn off the engine. 2. Do not keep using voltage above 200V. 3. Keep the welding area and earth cables within 1m. If the earth cable is close to gauges or connectors, failure could result. 4. Protect the seals and bearings located between the welding area and earth cables. 5. Never use the surrounding area of the work implement pin or cylinder as an earthing point. **Prevent Dropping Things into Machine Interior** 1. When checking through an open window or tank filler, be careful not to drop nuts, bolts or tools into the machine interior. If anything is dropped carelessly, take them out at once. 2. It is suggested not to take unnecessary items with you in your	**Precauciones al soldar** 1. Apague el motor. 2. No use voltaje superior a 200 V. 3. Mantenga el cable de masa a 1 m. o menos de distancia de la zona de soldadura. Si el cable de masa se encuentra cerca de los sensores o conectores, podría producirse un fallo. 4. Proteja las juntas redondas y los cojinetes situados entre la zona de soldadura y el cable de masa. 5. Nunca use como punto de masa el área que rodea el pasador o el cilindro hidráulico del equipo de trabajo. **Prevención de la caída de objetos en el interior de la máquina** 1. Cuando haga comprobaciones a través de una ventana o puerta, tenga cuidado de que no caigan tuercas, tornillos o herramientas en el interior de la máquina. Si algo cayese por accidente, retírelo inmediatamente. 2. Se recomienda no llevar objetos

pockets, take necessary tools only.	innecesarios en sus bolsillos, lleve solo las herramientas necesarias.
Dusty Environment Pay attention to the following instructions when working in dusty environments: 1. Check the air filter indicator regularly to see whether it is blocked. Service the air filter prior to the normal schedule. 2. Wash the radiator core frequently. Clean and replace the fuel filter periodically. 3. Clean the electrical units, especially the starter motor and alternator, to remove accumulated dust.	**Entorno polvoriento** Preste atención a las siguientes indicaciones para trabajar en un entorno con mucho polvo: 1. Revise el indicador del filtro de aire de forma regular para ver si se encuentra bloqueado. Realice el mantenimiento de esta pieza antes del horario programado. 2. Limpie el núcleo del radiador de forma regular. Limpie y cambie el filtro de combustible de forma regular. 3. Limpie las unidades eléctricas, especialmente el motor de arranque y el alternador, para eliminar el polvo acumulado.
Avoid Mixing Oil Do not use oils of different brands. If it is really needed, change the old oil prior to using the new oil of another brand.	**Evite mezclar aceite** No use aceites de marcas distintas. Si es necesario, vacíe el aceite viejo antes de emplear uno nuevo de una marca distinta.
Lock the covers If it is needed to service the machine with the covers opened, lock the covers with the lock lever.	**Bloqueo de las cubiertas** Si es necesario hacer el mantenimiento de la máquina con las cubiertas abiertas, bloquéelas con la palanca de bloqueo.
Purge Hydraulic System Purge the air from the hydraulic lines if the hydraulic lines or components have been repaired, replaced or removed.	**Purga del sistema hidráulico** Elimine el aire de las piezas del sistema hidráulico si se han reparado, cambiado o retirado.

Install Hydraulic Hoses 1. If components equipped with O-rings or gaskets need to be removed, clean the mounting surfaces. Do not forget to install new O-rings and gaskets. 2. When installing hoses, do not twist or bend them. This will damage and shorten the service life of the hoses. **Proper Fuel and Lubricant** Use proper fuel and lubricant that adopts to the environment. **Check Electrical Wiring** If a fuse is burnt out frequently or in short circuit, find out the reason and repair or contact your LiuGong dealer for assistance.	**Instalación de tuberías hidráulicas** 1. Si necesita retirar componentes con anillos tóricos o juntas, limpie las superficies de montaje. No olvide colocar anillos tóricos o juntas nuevos. 2. Cuando coloque las tuberías, no las doble o retuerza. Esto podría dañarlas y acortar su vida útil. **Lubricante y combustibles adecuados** Use lubricante y combustibles adecuados que se adapten al entorno. **Comprobación del cableado eléctrico** Si un fusible se quema frecuentemente o entra en cortocircuito encuentre la causa y repárela o contacte con su proveedor LiuGong para que le ayude.
Keep the battery surface clean. 1. Check the fuse for damage. Check the circuit for broken or shorted wires. Check the terminals for loose connections and tighten any loose parts. 2. Check the circuits of the battery, starter motor and alternator. 3. Contact your LiuGong dealer for more information about the solutions.	**Mantenga la superficie de la batería limpia** 1. Compruebe el fusible en busca de daños. compruebe el circuito para comprobar que no existan cables que se hayan roto o cortado. Compruebe los terminales para comprobar que no existan conexiones que estén sueltas. 2. Compruebe los circuitos de la batería, el motor de arranque y el alternador. 3. Contacte con su proveedor de LiuGong para obtener más información sobre las soluciones al problema.

Check Air Conditioner

Check the fan speed switch of the air conditioning system to see if it is at NEUTRAL position and the work mode switch at the OFF position. If not, turn them to the correct position.

Check Gauges

Check the gauges, lighting, indicators, horn and wipers for good condition. Contact your LiuGong dealer if any problems are found.

Before starting the engine, make sure nobody is on or near the machine. Keep the machine controlled by the operator.

Preparation before Maintenance

Park the machine as follows before maintenance:

1. Park the machine on flat ground.
2. Lower the bucket to the ground.
3. Set the engine speed to idling speed and run it for 3 minutes.
4. Turn the start switch to OFF position and take out the key.(If the machine needs to be maintained with the engine running, make sure the machine is under control of the operator)
5. Push the pilot control lever to LOCK position.
6. Attach a "DO NOT OPERATE" tag to right hand control lever if the machine is not operated.

Comprobación del aire acondicionado

Compruebe el interruptor de velocidad del ventilador del sistema de aire acondicionado para asegurar que se encuentra en posición NEUTRAL. Compruebe el interruptor de modo de trabajo para asegurar que se encuentra en posición OFF.

Comprobación de los niveles

Compruebe que los niveles, los faros, las luces de posición, la bocina y las escobillas estén en buen estado.

Antes de encender el motor, asegúrese que no hay nadie dentro o cerca de la máquina. El operario es el único que debe conducir la máquina.

Preparación para el mantenimiento

Antes del mantenimiento, estacione la máquina como se indica a continuación:

1. Estacione la máquina sobre terreno llano.
2. Baje el cazo al suelo.
3. Ponga el motor a velocidad de ralentí y manténgalo así durante 3 minutos.
4. Coloque el interruptor de arranque en la posición OFF y retire la llave. Si se requiere que el mantenimiento se realice con el motor en marcha, asegúrese que la máquina se encuentra bajo el control de un operario.
5. Coloque los servomandos en la posición LOCK.
6. Coloque el cartel “NO MANEJAR” sobre la palanca de mando derecha si la máquina

	no debe moverse.
Run-in The run-in of new machine is an important procedure for prolonging of the service life of the machine, eliminating fault and avoiding accidents. The user must read these guidelines for run-in a new excavator and how to operate and maintain the machine after purchase. **Run-in-Requirements for New Machine** 1. Run-in of a new machine is 100 hours. 2. Start the engine and run at idling speed for 15 seconds. Do not attempt to operate the hand control lever or the engine speed switch. 3. Run the machine at idling speed for 5 minutes for every start-up. 4. Avoid heavy load or high-speed operation during run-in period. 5. Avoid sudden start, speedup, steering or brake except emergency. 6. It is better to load with loose material during the first 50 hours in run-in period. Do not operate at a fast speed. Fill the bucket to 1/2 of its rated capacity. Increase the load capacity gradually after the first 50 hours. Keep the load within 3/4 of the bucket and properly decrease the operation speed.	**Rodaje** El rodaje de una máquina nueva es un procedimiento importante para alargar la vida útil de la máquina, evitando fallos y accidentes. El usuario debe leer las siguientes indicaciones para llevar a cabo un correcto rodaje de la máquina nueva y saber cómo operar y realizar el mantenimiento de la máquina tras la entrega. **Requerimientos para el rodaje en una máquina nueva** 1. El rodaje de una máquina nueva dura 100 horas. 2. Ponga en marcha el motor en velocidad de ralentí durante 15 segundos. No manipule el servomando manual ni el interruptor de velocidad del motor. 3. En cada puesta en marcha, ponga en marcha el motor en velocidad de ralentí durante 5 minutos. 4. Durante el periodo de rodaje, evite cargar peso excesivo u operar la máquina a altas velocidades. 5. Excepto en caso de emergencia, evite arrancar, acelerar, girar o frenar de forma brusca. 6. Es mejor cargar con material suelto durante las primeras 50 horas de rodaje. No opere a altas velocidades. Llene el cazo hasta la mitad de su capacidad nominal. Aumente la carga gradualmente después de las primeras 50 horas. Mantenga la carga por debajo de los 3/4 de la capacidad

7. Check the lubricant periodically. Replace or refill the lubricant according to the stipulated period. 8. Check the moving components of the machine. If any abnormalities are found, look for reasons and remove them. 9. Check the tightness of all bolts and nuts.	total del cazo y disminuya adecuadamente la velocidad de operación. 7. Compruebe el lubricante periódicamente. Reemplace o rellene el lubricante de acuerdo con el período estipulado. 8. Compruebe los componentes móviles de la máquina. Si se encuentra alguna anomalía, busque la causa y repárela. 9. Compruebe que todos los tornillos y tuercas estén apretados.
The following must be done after the first 8 hours of operation during the run-in period. 1. Check the tightness of all the bolts and nuts. 2. Check the belt tightness of the fan, engine and air conditioner compressor. 3. Check the level of the transmission oil, hydraulic oil, engine oil and coolant. 4. Check the water in fuel separator and the refrigerant of the air conditioner. 5. Check the hydraulic system for leakage. 6. Check temperature and connections of the electrical system, power supply of the alternator and the lights. 7. Lubricate the work implement pins every 8 hours (at the first 100 service hours) **Check oil level according to the relevant operation regulations.**	**Haga lo siguiente después de las primeras 8 horas de funcionamiento durante el período de rodaje** 1. Compruebe que todos los tornillos y tuercas estén apretados. 2. Compruebe que las correas del ventilador, del motor y del compresor del aire acondicionado estén apretadas. 3. Compruebe el nivel del aceite de la transmisión, del aceite hidráulico, del aceite de motor y del líquido refrigerante. 4. Compruebe el agua en el separador del combustible y el gas refrigerante del aire acondicionado. 5. Compruebe si hay fugas en el sistema hidráulico. 6. Compruebe la temperatura y las conexiones del sistema eléctrico, la alimentación del alternador y las luces. 7. Lubrique las partes móviles del equipo de trabajo cada 8 horas (durante las primeras 100 horas de servicio) **Compruebe el nivel de aceite de acuerdo con las normas de**

The following must be done after the first 50 hours of operation during the run-in period. 1. Lubricate the swing pin. (If equipped) 2. Lubricate the boom pin. 3. Lubricate the boom cylinder bottom pin. 4. Lubricate the boom swing cylinder pin. (If equipped) 5. Lubricate the arm, bucket and linkage pin. 6. Lubricate the dozer pin. (If equipped) 7. Clean the track and adjust the tension of it. 8. Clean the air filter parts. 9. Replace the engine oil. 10. Replace the engine oil filter 11. Replace the fuel pre-filter, fuel filter and fuel suction filter. 12. Check the torque of those bolts which are easily rusted. **Work should be done after the finish of run-in** 1. Check the tightness of all bolts and nuts, especially diesel cylinder cover nuts, exhaust pipe bolts and fixed bolts of diesel engine. 2. Check the tension of the fan belts. 3. Check, adjust and lubricate the components of the excavator after run-in. Clean the return filter element of hydraulic oil tank and check the hydraulic oil cleanness simultaneously. Replace the return filter element if	**funcionamiento correspondientes.** **Haga lo siguiente después de las primeras 50 horas de funcionamiento durante el período de rodaje** 1. Lubrique el pasador de la corona de giro (Si se encuentra equipada). 2. Lubrique el bulón de la pluma. 3. Lubrique el bulón inferior del cilindro de elevación de la pluma. 4. Lubrique el pasador del cilindro del balancín. (Si se encuentra equipado) 5. Lubrique el bulón del brazo, el cazo y el bulón de enganche. 6. Lubrique el bulón de la hoja de empuje. (Si se encuentra equipado) 7. Limpie la oruga y ajuste la tensión de la misma. 8. Limpie las piezas del filtro de aire. 9. Sustituya el aceite de motor. 10. Sustituya el filtro de aceite del motor. 11. Sustituya el prefiltro de combustible, el filtro de combustible y el filtro de aspiración de combustible. 12. Compruebe que los tornillos que se oxidan con facilidad estén apretados. **Haga lo siguiente tras finalizar el rodaje** 1. Compruebe que todos los tornillos y tuercas estén apretados, especialmente las tuercas de la tapa de los cilindros del motor diésel, los tornillos del tubo de escape y los tornillos de los soportes del

necessary. **Replace the hydraulic oil according to the stipulated procedures.**	motor diésel. 2. Compruebe la tensión de las correas del ventilador. 3. Compruebe, ajuste y lubrique los componentes de la excavadora después del rodaje. Limpie el filtro de retorno del depósito de aceite hidráulico y compruebe simultáneamente la limpieza del aceite hidráulico. Sustituya el filtro de retorno si es necesario. **Sustituya el aceite hidráulico según los procedimientos estipulados**
## Maintenance Interval Schedule **Read and understand all the safety instructions, warnings and indications before any operations or maintenances** The maintenance intervals stated in this manual are determined according to the service hour meter or calendar intervals shown (daily, weekly, monthly, etc.). LiuGong recommends that maintenance should be performed according to whichever of the above-mentioned intervals occurs first. Under extremely severe, dusty or wet operating conditions, more frequent lubrication that is specified in the “Maintenance Intervals” chart may be	## Programa de Intervalos de mantenimiento **Lea y comprenda todas las instrucciones de seguridad, advertencias e indicaciones antes de realizar cualquier operación o mantenimiento.** Los intervalos de mantenimiento indicados en este manual están indicados según el horómetro de servicio o los intervalos de fechas indicados (diario, semanal, mensual, etc.). LiuGong recomienda que el mantenimiento se realice según el intervalo que se cumpla en primer lugar. En condiciones de trabajo extremas, polvorientas o húmedas, puede ser necesaria una lubricación más frecuente que la especificada en la tabla de "Intervalos de mantenimiento".

necessary. Perform service on items at multiples of the original requirement. For example, at every 500 service hours or 3 months, also service those items listed under every 250 service hours or monthly, every 50 service hours or weekly and every 8 service hours or daily.	Realice el mantenimiento de las piezas en múltiplos del requerimiento original. Por ejemplo, cada 500 horas de servicio o 3 meses, realice también el mantenimiento de las piezas indicadas cada 250 horas de servicio o mensualmente, cada 50 horas de servicio o semanalmente y cada 8 horas de servicio o diariamente.
Every 8 Service Hours or Every Day ● Check the battery and the battery disconnect switch. ● Check the oil level of the engine. ● Check coolant level. ● Check hydraulic oil level. ● Check fuel level. ● Drain any water and trash from the fuel tank. ● Drain any water and trash from the fuel pre filter and fuel filter. ● Check the refrigerant for leakage. ● Check the lighting and gauges. ● Daily inspection. **Every 50 Service Hours or Every Week**	**Cada 8 horas de servicio o cada día** ● Compruebe la batería y el interruptor de desconexión de la batería. ● Compruebe el nivel de aceite de motor. ● Compruebe el nivel de líquido refrigerante. ● Compruebe el nivel de aceite hidráulico. ● Compruebe el nivel de combustible. ● Drene el agua y la suciedad del depósito de combustible. ● Drene el agua y la suciedad del prefiltro de combustible y del filtro de combustible. ● Compruebe si hay fugas de refrigerante. ● Compruebe las luces y los indicadores. ● Haga una Inspección diaria. **Cada 50 horas de servicio o cada**

In addition to the all previous service checks: ● Lubricate the boom pin. ● Lubricate the bottom pin of boom cylinder. ● Lubricate the arm, bucket and linkage pin. ● Lubricate the boom and arm linkage pin. ● Check and adjust the track. ● Clean the air filter. ● Change the engine oil for the first time. ● Change the engine oil filter for the first time. ● Change the fuel pre-filter for the first time. ● Change the fuel filter for the first time.	**semana** Además de todas las comprobaciones de servicio anteriores: ● Lubrique el bulón de la pluma. ● Lubrique el bulón inferior del cilindro de la pluma. ● Lubrique el bulón del balancín, del cazo y del enganche. ● Lubrique el bulón de unión de la pluma y el balancín. ● Compruebe y ajuste la oruga. ● Limpie el filtro de aire. ● Cambie el aceite del motor por primera vez. ● Cambie el filtro de aceite de motor por primera vez. ● Cambie el prefiltro de combustible por primera vez. ● Cambie el filtro de combustible por primera vez.
Every 100 Service Hours or Two Weeks In addition to the all previous service checks: ● Lubricate the boom and rod pivot pin. ● Lubricate the piston pin and bottom pin of arm cylinder. ● Lubricate the bottom pin of bucket cylinder. ● Lubricate the piston pin of boom cylinder and bottom pin of arm cylinder. ● Check and adjust belt tension of fan. ●Check and adjust belt tension of compressor.	**Cada 100 horas de servicio o dos semanas** Además de todas las comprobaciones de servicio anteriores: ● Lubrique el bulón de elevación y del pie de pluma. ● Lubrique el bulón del pistón y el bulón inferior del cilindro del brazo. ● Lubrique el bulón inferior del cilindro del cazo. ● Compruebe y ajuste la tensión de la correa del ventilador. ● Compruebe y ajuste la tensión de la correa del compresor.

Every 250 Service Hours or Every Month In addition to the all previous service checks: ● Check the swing reduction gear oil level. ● Check the travel reduction gear oil level. ● Check the tightening torque of bolts and nuts. ● Check the engine air intake system. ● Check the tension and condition of engine belt and compressor belt. ● Check the refrigerant level. ● Clean the fresh air filter and recirculating air filter of the cab.	**Cada 250 horas de servicio o cada mes** Además de todas las comprobaciones de servicio anteriores: ● Compruebe el nivel de aceite del engranaje del reductor de giro. ● Compruebe el nivel de aceite del engranaje del reductor de desplazamiento. ● Compruebe que los tornillos y tuercas estén apretados. ● Compruebe el sistema de admisión de aire del motor. ● Compruebe la tensión y el estado de la correa del motor y del compresor. ● Compruebe el nivel de gas refrigerante. ● Limpie el filtro anti polen y el filtro de recirculación de aire de la cabina.
Every 500 Service Hours or Three Months In addition to the all previous service checks: ● Lubricate the swing bearing. ● Lubricate the swing gear. ● Clean the surface of radiator group. ● Change the internal and external components of air filter. ● Replace the travel reduction gear oil for the first time (Replace it every 1000 hours later on) ● Replace the swing reduction gear oil for the first time (Replace it every 1000 hours later on). ● Clean the surface of the condenser. ● Change the engine oil. ● Change the engine oil filter.	**Cada 500 horas de servicio o tres meses** Además de todas las comprobaciones de servicio anteriores: ● Lubrique el cojinete de giro. ● Lubrique el engranaje de giro. ● Limpie la superficie de los radiadores. ●Cambie los componentes internos y externos del filtro de aire. ● Sustituya el aceite del engranaje del reductor de traslación por primera vez (sustitúyalo cada 1000 horas posteriormente). ● Sustituya el aceite del engranaje del reductor de giro por primera vez (sustitúyalo cada 1000 horas posteriormente). ● Limpie la superficie del condensador. ● Cambie el aceite del motor. ● Cambie el filtro del aceite de motor. ● Cambie el prefiltro de combustible. ● Cambie el filtro de combustible.

● Change the fuel pre-filter. ● Change the fuel filter. ● Replace the filter element of breather cap.	● Cambie el filtro de retorno del tapón del respiradero.
Every 1000 Service Hours or Six Months In addition to the all previous service checks: ● Adjust the engine valve lash. ● Clean the fuel lift pump filter. ● Replace the swing reduction gear oil. ● Replace the travel reduction gear oil. ● Replace the pilot oil filter. ● Replace the return filter of hydraulic oil tank. ● Lubricate the swing reduction gear bearing.	**Cada 1000 horas de servicio o seis meses** Además de todas las comprobaciones de servicio anteriores: ● Ajuste el juego de válvulas del motor. ● Limpie el filtro de la bomba de combustible. ● Sustituya el aceite del engranaje del reductor de giro. ● Sustituya el aceite del engranaje del reductor de desplazamiento. ● Sustituya el filtro del aceite de pilotaje. ● Sustituya el filtro de retorno del depósito de aceite hidráulico. ● Lubrique el cojinete del engranaje del reductor de giro.
Every 2000 Service Hours or Every Year In addition to the all previous service checks: ● Replace the hydraulic oil. ● Replace the suction oil filter of hydraulic oil tank. ● Replace the fuel suction filter. ● Replace the coolant and clean the internal surface of radiator. ● Check the air conditioner cooling hose and water hose for cracks, wear and foaming by oil contaminants. Check the joint and clamp for loose condition. ● Replace the recirculating air filter of the	**Cada 2000 horas de servicio o cada año** Además de todas las comprobaciones de servicio anteriores: ● Sustituya el aceite hidráulico. ● Sustituya el filtro de aspiración del depósito de aceite hidráulico. ● Sustituya el filtro de aspiración de combustible. ● Sustituya el líquido refrigerante y limpie la superficie interna del radiador. ● Compruebe la manguera de refrigeración del aire acondicionado y la manguera de agua para detectar grietas, desgaste y formación de espuma por contaminantes del aceite. Compruebe que la junta y la abrazadera no estén sueltas. ● Sustituya el filtro de recirculación de aire

cab. **Every 4500 Service Hours or 3 Years** ● Replace the aftertreatment diesel exhaust fluid dosing unit filter.	de la cabina. **Cada 4500 horas de servicio o 3 años** ● Sustituya el filtro de postratamiento de la unidad de dosificación de AdBlue.

4. Commentary:

The translation process does not only consist in putting words from one language into another. This process is highly complex and takes long hours to make. This complexity resides on the need to adjust to the conventions of a specific genre, but also on the necessity to be understood by the receiver. Added to that, languages operate with different grammatical codes, which makes it impossible to use the exact same words in the language of origin and the target language. Due to all these factors, during the years, translators have developed a set of different strategies to explain and justify the changes from one tongue to another. The most relevant groupings are the ones made by Vazquez Ayora (1977), Zaro and Truman (1998); and Molina and Hurtado (2002).

It must also be noted that the strategies that are used in each translation are chosen by the translators themselves and that is a personal choice. This can produce different variants of a text if it is translated by separate people. Also, in the case of the Spanish language, the presence of varieties also affects the outcome of the text, as the terminology present in Latin-American varieties does not coincide in some cases with the one present in the peninsular variety or others.

The following section will analyze the text translated above in more depth by explaining the different strategies that have been used to preserve the accuracy of the information as well as the conventions of the genre, being in this case the genre of technical translation, more concretely the translation of instruction manuals. These strategies will be classified and explained in more detail. The classification and description of the strategies below is mainly based on the translation strategies provided by Vázquez Ayora in his manual on traductology *Introduction to Traductology* (1977). These descriptions will be provided alongside with some examples that clarify the need to use them and the way in which they affect the text in the target language.

4.1 Translation strategies:

Transposition:

As Vázquez-Ayora (1977) explains, transposition is a strategy that consists in changing the grammatical category of the translated term. This technique is used in order to make the text more natural for the reader in the target language. Vázquez-Ayora provides different varieties of this technique, but in this case, I will focus on the most relevant cases from the text above:

Example 1:
En: Check Service Hour Meter
Spa: Comprobación del horómetro de servicio

Example 2:
En: Clean Engine Oil
Spa: Limpieza del aceite de motor

The most common case during the translation of the text above has been the transformation of the section titles so as to make clear which step is explained in each section. Example number 1 provides one extract in which we can clearly see the changes that have taken place. As we can see above, in the original text, the forms are infinitive or imperative verbs, while in the translated text, they have become nominalizations. In instruction manuals written in English, the imperative form of a verb is not only used to

give orders, but also to introduce sections. On the other hand, instruction manuals written in Spanish make use of either infinitives or noun-participles. In the case of this manual, I have chosen to make use of the noun-participle because the parallel text that I have consulted (Komatsu, 2008) makes use of this kind of vocabulary.

Modulation:

This strategy is very similar to the one seen above, which can also occur when there is a change in the grammatical category of the words translated. Nevertheless, this strategy is different in the sense that the change is mainly noticeable in terms of signification. That is, the main change is not the grammatical category, but the meaning. The following examples will be useful to display the differences between both strategies:

Example 5:
En: Keep the machine controlled by the operator.
Spa: El operario es el único que debe conducir la máquina.

In this example, the modulation does not only change the grammatical category of the underlined words. In this case, the modulation is made so as to make clear which is the intention of this notice, which is to prevent people who do not know how to operate a machine from doing it. If it were a literal translation, the ambiguity of the text could have caused an accident in the working environment.

Example 6:

En: eliminating fault and avoiding accidents.
Spa: evitando fallos y accidentes.

In this case, in Spanish the word "eliminar" (eliminate) does not collocate with "fallos" (fault), which is the reason why there has been a modulation in terms of vocabulary, using the verb "evitar" (to avoid) and thus linking the two elements of the sentence in order to make it easier to read and understand.

Amplification:

Although the tendency of languages is to express concepts in fewer words, during the process of translation sometimes it is not possible to convey all the information in the same number of words. According to Vázquez-Ayora (1977), amplification occurs in these cases. This technique is used to make a clarification if it is needed in the target language. In this text there are not many examples, but the examples that can be found are especially notable:

Example 8:
Eng: Maintain Machine on Schedule
Spa: Realice el mantenimiento de la máquina siempre dentro del programa indicado en la tabla de mantenimiento.

In this case, the amplification is made in order to clarify that the schedule the manual refers to is the one indicated in one section of the same manual. This is done because the word “Horario”, which would be the literal translation, also refers to the working shift of the operator or maintenance workers, which can lead to confusion.

Example 9:
Eng: Daily inspection.
Spa: Haga una Inspección diaria.

In this case the amplification is made with the purpose to keep the conventions of the genre. One of the most relevant conventions of the genre of instruction manuals is the presence of repetition through all the text. This repetition is carried out so as to make the text easier to remember. In this case, the different steps are introduced by a verb form, so I made the choice to use the amplification strategy in order to make the text homogeneous. Finally, when literal translation is not possible in terms of meaning, the technique of amplification is a helpful resource to make the text understandable and clear. The following example clarifies the use of an amplification in cases of ambiguity of meanings:

Example 4:
En: Maintain the machine
Spa: realizar el mantenimiento de la máquina

In this case, the literal translation is not possible, as the meanings of “mantener” and “realizar el mantenimiento” are not the same. In the first case, according to the RAE dictionary, “mantener” means to support someone (mainly economically or physically). On the other hand, “realizar el mantenimiento” means to maintain a machine.

Explicitation:

This translation technique also involves adding more words to the text in the target language, but its main difference resides in its intention. While amplification is used to convey a meaning that does not have the same number of words in the two languages, explicitation makes use of more words in order to explain something. In the following example, this can be appreciated:

Example 3:
En: Clean the windshield
Spa: Limpie el parabrisas

In the instructions, inside each section I have used the imperative with the formal “you” form, so as to address the person who is doing the maintenance directly, whereas in English the imperative form does not make a formal or informal distinction. The fact that the addressee is mentioned in Spanish, even if the subjects can be omitted, is the main factor why we can conclude that the technique used is an explicitation.

Omision:

This technique consists in the choice of the translator to not include some of the information of the original text. It is usually applied in order to avoid redundance or extreme repetition. In the following example we have a clear case of omission:

Example 10:
En: Check the fan speed switch of the air conditioning system to see if it is at NEUTRAL position and the work mode switch at the OFF position. If not, turn them to the correct position.
Spa: Compruebe el interruptor de velocidad del ventilador del sistema de aire acondicionado para asegurar que se encuentra en posición NEUTRAL. Compruebe el interruptor de modo de trabajo para asegurar que se encuentra en posición OFF.

In this case, the omission was applied because in the original text it was already implied that the switches mentioned should be put in certain positions. Added to that, in the Spanish translation the meaning of the omitted sentence is reinforced by the use of the verb "asegurar", which implies that the person who checks this part of the machine should reassure that the switches are in the described position.

Variation:

This translation strategy was not extracted from Vázquez-Ayora's (1977) classification, it was extracted from the strategies proposed by Molina and Hurtado Albir (2001). This is a technique which is very broad, as it can contain changes in the linguistic and paralinguistic aspects. In the case of the following examples, we mainly see a change in the syntactic order or in the appearance of sentences, so as to make the text easier to read for the target reader in the LM:

Example 7:
En: Park the machine as follows before maintenance:

Spa: Antes del mantenimiento, estacione la máquina como se indica a continuación:

The case above shows a change in the syntactic order, as in Spanish it is more common to put time indications at the beginning of the sentences.

4.2 Other Problems:

Added to the translating strategies that have been used, there are some other considerations to make. The translation strategies are not the only problems that a translator finds during the process of translation. It is common that some other factors intervene in this process and they clearly affect the outcome of the text in the target language.

In the case of this text, there have been two main sources of difficulties that had to be overcome. Firstly, the source text was not originally written in English, it was written in Chinese. The translation to the English language can produce a loss of details. Also, it must be noted that the source text in English has not resulted in the best quality text. In some cases, the use of the English language seems to be too ambiguous and basic. It does not have the required technicality of a text that properly belongs to this genre. Added to that, there has been a case of grammatical incorrectness, which had to be solved in the translation to Spanish. This case was the sentence in the source text: "Use proper fuel and lubricant that adopts to the environment." This problem was solved by understanding of the purpose of the text. In this case, the purpose was to imply that the fuel and lubricant to use had to be the proper one for each working environment. Thus, the translation reflects this with the sentence "Use lubricante y combustibles adecuados que se adapten al entorno".

Secondly, another problem that is also related to the poor quality of the text is the presence of extracts from other manuals that have not been corrected or adapted to the current one. It is a common practice that, in order to save money, the companies that need several translations of similar texts only send some of them to be translated. Then, they usually complete the rest of the translations by using pieces of the commissioned texts. In the case of this text, this was obvious in some parts of the text. For instance, under the section "Run-in" the sentence "The user must read these guidelines for run-in a new excavator and how to operate and maintain the machine after purchase." appears. In this sentence, it is specified that the machine is an excavator, which, in the case of this manual, is incorrect. This manual belongs to a loader, not to an excavator. Added to that, some sentences above, there is also mentioned the presence of a "pilot control lever", which in the case of this machine is not correct, as it does not have a lever, it has a switch. In both cases, the tendency has been to make a generalization in Spanish so as to avoid the mistake and make the text comprehensible. In the case of the first sentence, the substitute of "excavator" has been "máquina", which is a much more general term. Also, the substitute to "lever" has been "servomandos", which can refer to both levers and switches. Finally, the last issue that has been solved during the translation of the text is the need to be coherent with the names that are written on the pieces of the machine. After some research about how the machine is sold in Spain, it was found that the security labels and the software of the machine were translated to Spanish. On the other hand, the names on the levers, switches and indicators are not translated, as it would be very expensive to produce pieces exclusively for speakers of Spanish. That is the reason why during the translation process it was decided that the name that appears on the different pieces should be the one appearing in the manual as well.

5. Technical terminology glossary:

I have tried to find the correct equivalences for the technical terminology in the text in order to make the TM as similar to the original as possible. There is a Terminology glossary in the next section that has the technical terminology that I have found more difficult to translate, as well as the definition for the terms and the source for the definitions.

English technical term: DEF	**Spanish equivalent:** AdBlue
Definition: Diesel exhaust fluid (DEF; also known as AUS 32 and marketed as AdBlue) is a liquid used to reduce the amount of air pollution created by a diesel engine.	**Definition:** AdBlue es la marca registrada del producto urea AUS32 (disolución de urea al 32.5%), utilizado para reducir las emisiones de óxidos de nitrógeno (NOx) causadas por los escapes de los motores diésel.
Source: (Wikipedia, 2021)	**Fuente:** (Wikipedia, 2021)

Translating technique applied: Equivalence.

English technical term: Coolant	**Spanish equivalent**: Líquido refrigerante
Definition: Coolant is a liquid used to keep a machine or engine cool while it is operating.	**Definition:** Se denomina refrigerante o fluido frigorígeno al utilizado en la transmisión de calor que, en un sistema de refrigeración, absorbe calor a bajas temperaturas y presión, cediéndolo a temperatura y presión más elevadas.
Source: (Collins, 2021)	**Fuente:** (Wikipedia, 2021)

Translating technique applied: Equivalence

English technical term: Service Hour Meter	**Spanish equivalent**: Horómetro de Servicio

Definition: An hour meter is one of those simple devices design engineers or maintenance technicians may rarely think about. Yet, they may provide the most inexpensive source of equipment reliability insurance that a manufacturer can offer with their product.	**Definition:** Un Horómetro es un dispositivo que registra el número de horas en que un motor o un equipo, generalmente eléctrico o mecánico ha funcionado desde la última vez que se ha inicializado el dispositivo. Estos dispositivos son utilizados para controlar las intervenciones de mantenimiento preventivo de los equipos.
Source: (Honeywell International Inc., 2007)	**Fuente:** (Sensagent Corporation, 2013)

Translating technique applied: Equivalence

6. Conclusions:

Overall, it has not been easy to make this translation. The fact that English is not the original language of the text has been one of the most relevant issues, as it does not only affect the level of detail of the text, but also the type of vocabulary and the precision of its use. Despite this, the text provides an example of what, in my opinion, will be the norm. That is, nowadays, the resources invested into translations for technical manuals are constantly decreasing. This is done through some practices that are becoming more common with the time. For instance, as explained previously, some businesses only commission one part of the texts to translate and then they use these translations to "build" new ones. Moreover, some businesses make use of automated translation tools, which with the time have improved, but lack the ability to understand the context and the genre. To sum up, there is a need to be careful when translating specialized texts, as it can cause problems of comprehension that can end up in serious problems not only for the user of the product, but also for the business itself. Personally, I think that the translation of this text does not only contribute to the possible translation of manuals that need to be translated to a third language; but also, it can be useful to reflect on how a translation that has been prepared carefully is the only way to prevent and solve problems.

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Anexo I: Original Text

129 August 14, 2019 Maintenance Manual CLG950E Maintenance Guidance

Maintenance Manual

CAUTION!

Perform the maintenance procedures at the intervals according to this manual. Proper maintenance will extend the service life of the machine and provide safer operation.

Maintenance Guidance:

Correct Maintenance Procedures

Learn how to maintain your machine correctly. Follow the instructions of this manual, if your machine has troubles, you must maintain or contact your dealer before operating.

Daily Checks

1. Check the gauges.
2. Check the coolant, DEF, fuel and oil level.
3. Check hoses and tubes for leakage, wear conditions and damage.
4. Perform a walk-around inspection of the machine.
5. Check for loose or missing parts.

Check Service Hour Meter

The service hour meter determines when your machine needs to be maintained. The time in the maintenance table is basically given for normal operation. If the machine is operated in severe conditions, you must maintain the machine more frequently.

Maintain Machine on Schedule

Follow the maintenance methods listed in this maintenance manual.

Maintenance Suggestions

1. Use only recommended, DEF, fuels and lubricants.
2. Don't adjust the engine speed setting and/or the hydraulic safety valve.
3. Protect electronic units from water and vapor.
4. Do not disassemble electronic units such as sensors etc.
5. Use only recommended LiuGong parts.

Cleanser of Windshield

Clean the windshield with special windshield cleanser and ensure no foreign matter mixes with cleanser.

Clean Engine Oil

Use clean engine oil and keep the engine oil clean. Ensure no foreign matter mixes with the engine oil.

Check Discharged Oil or Used Filter Element

After replacing the oil or filter element, check the discharged oil or filter element

for iron particles and foreign matter. If any iron particles or foreign matter is found, report this immediately and take preventive measures.

Welding Cautions

1. Turn off the engine.
2. Do not keep using voltage above 200V.
3. Keep the welding area and earth cables within 1m. If the earth cable is close to gauges or connectors, failure could result.
4. Protect the seals and bearings located between the welding area and earth cables.
5. Never use the surrounding area of the work implement pin or cylinder as an earthing point.

Prevent Dropping Things into Machine Interior

1. When checking through an open window or tank filler, be careful not to drop nuts, bolts or tools into the machine interior. If anything is dropped carelessly, take them out at once.
2. It is suggested not to take unnecessary items with you in your pockets, take necessary tools only.

Dusty Environment

Pay attention to the following instructions when working in dusty environments:

1. Check the air filter indicator regularly to see whether it is blocked. Service the air filter prior to the normal schedule.
2. Wash the radiator core frequently. Clean and replace the fuel filter periodically.
3. Clean the electrical units, especially the starter motor and alternator, to remove accumulated dust.

Avoid Mixing Oil

Do not use oils of different brands. If it is really needed, change the old oil prior to using the new oil of another brand.

Lock the covers

If it is needed to service the machine with the covers opened, lock the covers with the lock lever.

Purge Hydraulic System

Purge the air from the hydraulic lines if the hydraulic lines or components have been repaired, replaced or removed.

Install Hydraulic Hoses

1. If components equipped with O-rings or gaskets need to be removed, clean the mounting surfaces. Do not forget to install new O-rings and gaskets.
2. When installing hoses, do not twist or bend them. This will damage and shorten the service life of the hoses.

Proper Fuel and Lubricant

Use proper fuel and lubricant that adopts to the environment.

Check Electrical Wiring

If a fuse is burnt out frequently or in short circuit, find out the reason and repair or contact your LiuGong dealer for assistance.

Keep the battery surface clean.

1. Check the fuse for damage. Check the circuit for broken or shorted wires. Check the terminals for loose connections and tighten any loose parts.
2. Check the circuits of the battery, starter motor and alternator.
3. Contact your LiuGong dealer for more information about the solutions.

Check Air Conditioner

Check the fan speed switch of the air conditioning system to see if it is at NEUTRAL position and the work mode switch at the OFF position. If not, turn them to the correct position.

Check Gauges

Check the gauges, lighting, indicators, horn and wipers for good condition. Contact your LiuGong dealer if any problems are found.

Before starting the engine, make sure nobody is on or near the machine. Keep the machine controlled by the operator.

Preparation before Maintenance

Park the machine as follows before maintenance:

1. Park the machine on flat ground.
2. Lower the bucket to the ground.
3. Set the engine speed to idling speed and run it for 3 minutes.
4. Turn the start switch to OFF position and take out the key.(If the machine needs to be maintained with the engine running, make sure the machine is under control of the operator)
5. Push the pilot control lever to LOCK position.

Attach a "DO NOT OPERATE" tag to right hand control lever if the machine is not operated.

Run-in

The run-in of new machine is an important procedure for prolonging of the service life of the machine, eliminating fault and avoiding

accidents. The user must read these guidelines for run-in a new excavator and how to operate and maintain the machine after purchase.

Run-in-Requirements for New Machine

1. Run-in of a new machine is 100 hours.
2. Start the engine and run at idling speed for 15 seconds. Do not attempt to operate the hand control lever or the engine speed switch.
3. Run the machine at idling speed for 5 minutes for every start-up.
4. Avoid heavy load or high speed operation during run-in period.
5. Avoid sudden start, speedup, steering or brake except emergency.
6. It is better to load with loose material

during the first 50 hours in run-in period. Do not operate at a fast speed. Fill the bucket to 1/2 of its rated capacity. Increase the load capacity gradually after the first 50 hours. Keep the load within 3/4 of the bucket and properly decrease the operation speed.

7. Check the lubricant periodically. Replace or refill the lubricant according to the stipulated period.

8. Check the moving components of the machine. If any abnormalities are found, look for reasons and remove them.

9. Check the tightness of all bolts and nuts.

The following must be done after the first 8 hours of operation during the run-in period.

1. Check the tightness of all the bolts and nuts.

2. Check the belt tightness of the fan, engine and air conditioner compressor.

3. Check the level of the transmission oil, hydraulic oil, engine oil and coolant.

4. Check the water in fuel separator and the refrigerant of the air conditioner.

5. Check the hydraulic system for leakage.

6. Check temperature and connections of the electrical system, power supply of the alternator and the lights.

7. Lubricate the work implement pins every 8 hours (at the first 100 service hours)

Check oil level according to the relevant operation regulations.

The following must be done after the first 50 hours of operation during the run-in period.

1. Lubricate the swing pin. (If equipped)

2. Lubricate the boom pin.

3. Lubricate the boom cylinder bottom pin.

4. Lubricate the boom swing cylinder pin. (If equipped)

5. Lubricate the arm, bucket and linkage pin.

6. Lubricate the dozer pin. (If equipped)

7. Clean the track and adjust the tension of it.

8. Clean the air filter parts.

9. Replace the engine oil.

10. Replace the engine oil filter

11. Replace the fuel pre-filter, fuel filter and fuel suction filter.

12. Check the torque of those bolts which are easily rusted.

Work should be done after the finish of run-in

1. Check the tightness of all bolts and nuts, especially diesel cylinder cover nuts, exhaust pipe bolts and fixed bolts of diesel engine.

2. Check the tension of the fan belts.

3. Check, adjust and lubricate the components of the excavator after run-in. Clean the return filter element of hydraulic oil tank and check the hydraulic oil cleanness simultaneously. Replace the return filter element if necessary.

Replace the hydraulic oil according

to the stipulated procedures.

Maintenance Interval Schedule

Read and understand all the safety instructions, warnings and indications before any operations or maintenances

The maintenance intervals stated in this manual are determined according to the service hour meter or calendar intervals shown (daily, weekly, monthly, etc.). LiuGong recommends that maintenance should be performed according to whichever of the above-mentioned intervals occurs first.

Under extremely severe, dusty or wet operating conditions, more frequent lubrication that is specified in the "Maintenance Intervals" chart may be necessary.

Perform service on items at multiples of the original requirement. For example, at every 500 service hours or 3 months, also service those items listed under every 250 service hours or monthly, every 50 service hours or weekly and every 8 service hours or daily.

Every 8 Service Hours or Every Day

- Check the battery and the battery disconnect switch.
- Check the oil level of the engine.
- Check coolant level.
- Check hydraulic oil level.
- Check fuel level.
- Drain any water and trash from the fuel tank.
- Drain any water and trash from the fuel pre filter and fuel filter.
- Check the refrigerant for leakage.
- Check the lighting and gauges.
- Daily inspection.

Every 50 Service Hours or Every Week

In addition to the all previous service checks:

- Lubricate the boom pin.
- Lubricate the bottom pin of boom cylinder.
- Lubricate the arm, bucket and linkage pin.
- Lubricate the boom and arm linkage pin.
- Check and adjust the track.
- Clean the air filter.
- Change the engine oil for the first time.
- Change the engine oil filter for the first time.
- Change the fuel pre-filter for the first time.
- Change the fuel filter for the first time.

Every 100 Service Hours or Two Weeks

In addition to the all previous service checks:

- Lubricate the boom and rod pivot pin.

● Lubricate the piston pin and bottom pin of arm cylinder.

● Lubricate the bottom pin of bucket cylinder.

● Lubricate the piston pin of boom cylinder and bottom pin of arm cylinder.

● Check and adjust belt tension of fan.

●Check and adjust belt tension of compressor.

Every 250 Service Hours or Every Month

In addition to the all previous service checks:

● Check the swing reduction gear oil level.

● Check the travel reduction gear oil level.

● Check the tightening torque of bolts and nuts.

● Check the engine air intake system.

● Check the tension and condition of engine belt and compressor belt.

● Check the refrigerant level.

● Clean the fresh air filter and recirculating air filter of the cab.

Every 500 Service Hours or Three Months

In addition to the all previous service checks:

● Lubricate the swing bearing.

● Lubricate the swing gear.

● Clean the surface of radiator group.

● Change the internal and external components of air filter.

Every 2000 Service Hours or Every Year

● Replace the travel reduction gear oil for the first time (Replace it every 1000 hours later on)

● Replace the swing reduction gear oil for the first time (Replace it every 1000 hours later on).

● Clean the surface of the condenser.

● Change the engine oil.

● Change the engine oil filter.

● Change the fuel pre-filter.

● Change the fuel filter.

● Replace the filter element of breather cap.

Every 1000 Service Hours or Six Months

In addition to the all previous service checks:

● Adjust the engine valve lash.

● Clean the fuel lift pump filter.

● Replace the swing reduction gear oil.

● Replace the travel reduction gear oil.

● Replace the pilot oil filter.

● Replace the return filter of hydraulic oil tank.

● Lubricate the swing reduction gear bearing.

In addition to the all previous service checks:

● Replace the hydraulic oil.

● Replace the suction oil filter of hydraulic oil tank.

● Replace the fuel suction filter.

● Replace the coolant and clean the internal surface of radiator.

● Check the air conditioner cooling hose and water hose for cracks, wear and foaming by oil contaminants. Check the

joint and clamp for loose condition.

● Replace the recirculating air filter of the cab.

Every 4500 Service Hours or 3 Years

● Replace the aftertreatment diesel exhaust fluid dosing unit filter.

Anexo II: Complete Translation

129 14 de agosto de 2019. Manual de mantenimiento CLG950E Guía de mantenimiento.

Manual de mantenimiento:

ADVERTENCIA

Realice el mantenimiento de la máquina tal y como se indica en este manual. El correcto mantenimiento permitirá alargar la vida útil de la máquina y proporcionará un uso más seguro.

Guía de mantenimiento:

Correcto mantenimiento:

Para aprender cómo realizar el correcto mantenimiento de la máquina, siga las instrucciones de este manual. Si su máquina da problemas, contacte con su proveedor antes de operar con ella.

Comprobaciones diarias:

1. Compruebe los sensores.
2. Compruebe los niveles de líquido refrigerante, AdBlue, combustible y aceite.
3. Compruebe que los tubos y mangueras no goteen, no estén desgastados ni dañados.
4. Realice una inspección visual de la máquina.
5. Compruebe que no falten piezas o que estén sueltas.

Comprobación del horómetro de servicio

El horómetro de servicio indica cuándo se debe realizar el mantenimiento de la máquina. El programa indicado en la tabla de mantenimiento es orientativo y está adaptado a condiciones normales de uso. Si la máquina es sometida a condiciones extremas, se debe realizar el mantenimiento más a menudo.

Realice el mantenimiento de la máquina siempre dentro del programa indicado en la tabla de mantenimiento

Siga los métodos enumerados en este manual.

Sugerencias de mantenimiento

1. Use solo los AdBlue, combustibles y lubricantes recomendados.
2. No ajuste la velocidad predeterminada del motor ni la válvula de seguridad hidráulica.
3. Proteja los dispositivos electrónicos del agua y el vapor.
4. No desmonte los dispositivos electrónicos tales como sensores, etc.
5. Use solo los repuestos recomendados por LiuGong.

Limpieza del parabrisas

Limpie el parabrisas con producto de limpieza y asegúrese de que no se mezcle materia extraña con el producto.

Limpieza del aceite de motor

Use aceite de motor nuevo y manténgalo

limpio. Asegúrese de que no se mezcle materia extraña con el aceite.

Revisión del aceite de motor viejo y el filtro usado

Tras cambiar el aceite o el filtro, revise el aceite viejo o el filtro retirado en busca de partículas de hierro o materia extraña. Si encontrase algún tipo de materia extraña, informe inmediatamente de ello y tome medidas preventivas.

Precauciones al soldar

1. Apague el motor.
2. No use voltaje superior a 200 V.
3. Mantenga el cable de masa a 1 m. o menos de distancia de la zona de soldadura. Si el cable de masa se encuentra cerca de los sensores o conectores, podría producirse un fallo.
4. Proteja las juntas redondas y los cojinetes situados entre la zona de soldadura y el cable de masa.
5. Nunca use como punto de masa el área que rodea el pasador o el cilindro hidráulico del equipo de trabajo.

Prevención de la caída de objetos en el interior de la máquina

1. Cuando haga comprobaciones a través de una ventana o puerta, tenga cuidado de que no caigan tuercas, tornillos o herramientas en el interior de la máquina. Si algo cayese por accidente, retírelo inmediatamente.
2. Se recomienda no llevar objetos innecesarios en sus bolsillos, lleve solo las herramientas necesarias.

Entorno polvoriento

Preste atención a las siguientes indicaciones para trabajar en un entorno con mucho polvo:

1. Revise el indicador del filtro de aire de forma regular para ver si se encuentra bloqueado. Realice el mantenimiento de esta pieza antes del horario programado.
2. Limpie el núcleo del radiador de forma regular. Limpie y cambie el filtro de combustible de forma regular.
3. Limpie las unidades eléctricas, especialmente el motor de arranque y el alternador, para eliminar el polvo acumulado.

Evite mezclar aceite

No use aceites de marcas distintas. Si es necesario, vacíe el aceite viejo antes de emplear uno nuevo de una marca distinta.

Bloqueo de las cubiertas

Si es necesario hacer el mantenimiento de la máquina con las cubiertas abiertas, bloquéelas con la palanca de bloqueo.

Purga del sistema hidráulico

Elimine el aire de las piezas del sistema hidráulico si se han reparado, cambiado o retirado.

Instalación de tuberías hidráulicas

1. Si necesita retirar componentes con anillos tóricos o juntas, limpie las superficies de montaje. No olvide colocar anillos tóricos o juntas nuevos.
2. Cuando coloque las tuberías, no las doble o retuerza. Esto podría dañarlas y

acortar su vida útil.

Lubricante y combustibles adecuados

Use lubricante y combustibles adecuados que se adapten al entorno.

Comprobación del cableado eléctrico

Si un fusible se quema frecuentemente o entra en cortocircuito encuentre la causa y repárela o contacte con su proveedor LiuGong para que le ayude.

Mantenga la superficie de la batería limpia

1. compruebe el fusible en busca de daños. compruebe el circuito para comprobar que no existan cables que se hayan roto o cortado. Compruebe los terminales para comprobar que no existan conexiones que estén sueltas.
2. Compruebe los circuitos de la batería, el motor de arranque y el alternador.
3. Contacte con su proveedor de LiuGong para obtener más información sobre las soluciones al problema.

Comprobación del aire acondicionado

Compruebe el interruptor de velocidad del ventilador del sistema de aire acondicionado para asegurar que se encuentra en posición NEUTRAL. Compruebe el interruptor de modo de trabajo para asegurar que se encuentra en posición OFF.

Comprobación de los niveles

Compruebe que los niveles, los faros, las luces de posición, la bocina y las escobillas estén en buen estado.

Antes de encender el motor, asegúrese que no hay nadie dentro o cerca de la máquina. El operario es el único que debe conducir la máquina.

Preparación para el mantenimiento

Antes del mantenimiento, estacione la máquina como se indica a continuación:

1. Estacione la máquina sobre terreno llano.
2. Baje el cazo al suelo.
3. Ponga el motor a velocidad de ralentí y manténgalo así durante 3 minutos.
4. Coloque el interruptor de arranque en la posición OFF y retire la llave. Si se requiere que el mantenimiento se realice con el motor en marcha, asegúrese que la máquina se encuentra bajo el control de un operario.
5. Coloque los servomandos en la posición LOCK.
6. Coloque el cartel “NO MANEJAR” sobre la palanca de mando derecha si la máquina no debe moverse.

Rodaje

El rodaje de una máquina nueva es un procedimiento importante para alargar la vida útil de la máquina, evitando fallos y accidentes. El usuario debe leer las siguientes indicaciones para llevar a cabo un correcto rodaje de la máquina nueva y saber cómo operar y realizar el mantenimiento de la máquina tras la entrega.

Requerimientos para el rodaje en una

máquina nueva

1. El rodaje de una máquina nueva dura 100 horas.
2. Ponga en marcha el motor en velocidad de ralentí durante 15 segundos. No manipule el servomando manual ni el interruptor de velocidad del motor.
3. En cada puesta en marcha, ponga en marcha el motor en velocidad de ralentí durante 5 minutos.
4. Durante el periodo de rodaje, evite cargar peso excesivo u operar la máquina a altas velocidades.
5. Excepto en caso de emergencia, evite arrancar, acelerar, girar o frenar de forma brusca.
6. Es mejor cargar con material suelto durante las primeras 50 horas de rodaje.

No opere a altas velocidades. Llene el cazo hasta la mitad de su capacidad nominal. Aumente la carga gradualmente después de las primeras 50 horas. Mantenga la carga por debajo de los 3/4 de la capacidad total del cazo y disminuya adecuadamente la velocidad de operación.

7. Compruebe el lubricante periódicamente. Reemplace o rellene el lubricante de acuerdo con el período estipulado.
8. Compruebe los componentes móviles de la máquina. Si se encuentra alguna anomalía, busque la causa y repárela.
9. Compruebe que todos los tornillos y tuercas estén apretados.

Haga lo siguiente después de las primeras 8 horas de funcionamiento durante el período de rodaje

1. Compruebe que todos los tornillos y tuercas estén apretados.
2. Compruebe que las correas del ventilador, del motor y del compresor del aire acondicionado estén apretadas.
3. Compruebe el nivel del aceite de la transmisión, del aceite hidráulico, del aceite de motor y del líquido refrigerante.
4. Compruebe el agua en el separador del combustible y el gas refrigerante del aire acondicionado.
5. Compruebe si hay fugas en el sistema hidráulico.
6. Compruebe la temperatura y las conexiones del sistema eléctrico, la alimentación del alternador y las luces.
7. Lubrique las partes móviles del equipo de trabajo cada 8 horas (durante las primeras 100 horas de servicio)

Compruebe el nivel de aceite de acuerdo con las normas de funcionamiento correspondientes.

Haga lo siguiente después de las primeras 50 horas de funcionamiento durante el período de rodaje

1. Lubrique el pasador de la corona de giro (Si se encuentra equipada).

2. Lubrique el bulón de la pluma.

3. Lubrique el bulón inferior del cilindro de elevación de la pluma.

4. Lubrique el pasador del cilindro del balancín. (Si se encuentra equipado)

5. Lubrique el bulón del brazo, el cazo y el bulón de enganche.

6. Lubrique el bulón de la hoja de empuje. (Si se encuentra equipado)

7. Limpie la oruga y ajuste la tensión de la misma.

8. Limpie las piezas del filtro de aire.

9. Sustituya el aceite de motor.

10. Sustituya el filtro de aceite del motor.

11. Sustituya el prefiltro de combustible, el filtro de combustible y el filtro de aspiración de combustible.

12. Compruebe que los tornillos que se oxidan con facilidad estén apretados.

Haga lo siguiente tras finalizar el rodaje

1. Compruebe que todos los tornillos y tuercas estén apretados, especialmente las tuercas de la tapa de los cilindros del motor diésel, los tornillos del tubo de escape y los tornillos de los soportes del motor diésel.

2. Compruebe la tensión de las correas del ventilador.

3. Compruebe, ajuste y lubrique los componentes de la excavadora después del rodaje. Limpie el filtro de retorno del depósito de aceite hidráulico y compruebe simultáneamente la limpieza del aceite hidráulico. Sustituya el filtro de retorno si es necesario.

Sustituya el aceite hidráulico según los procedimientos estipulados

Programa de Intervalos de mantenimiento

Lea y comprenda todas las instrucciones de seguridad, advertencias e indicaciones antes de realizar cualquier operación o mantenimiento.

Los intervalos de mantenimiento indicados en este manual están indicados según el horómetro de servicio o los intervalos de fechas indicados (diario, semanal, mensual, etc.). LiuGong recomienda que el mantenimiento se realice según el intervalo que se cumpla en primer lugar.

En condiciones de trabajo extremas, polvorientas o húmedas, puede ser necesaria una lubricación más frecuente que la especificada en la tabla de "Intervalos de mantenimiento".

Realice el mantenimiento de las piezas en múltiplos del requerimiento original. Por ejemplo, cada 500 horas de servicio o 3 meses, realice también el mantenimiento de las piezas indicadas cada 250 horas de servicio o mensualmente, cada 50 horas de servicio o semanalmente y cada 8 horas de servicio o diariamente.

Cada 8 horas de servicio o cada día

● Compruebe la batería y el interruptor de desconexión de la batería.

● Compruebe el nivel de aceite de motor.

● Compruebe el nivel de líquido refrigerante.

● Compruebe el nivel de aceite hidráulico.

● Compruebe el nivel de combustible.

● Drene el agua y la suciedad del depósito de combustible.

● Drene el agua y la suciedad del prefiltro de combustible y del filtro de combustible.

● Compruebe si hay fugas de refrigerante.

● Compruebe las luces y los indicadores.

● Haga una Inspección diaria.

Cada 50 horas de servicio o cada semana

Además de todas las comprobaciones de servicio anteriores:

● Lubrique el bulón de la pluma.

● Lubrique el bulón inferior del cilindro de la pluma.

● Lubrique el bulón del balancín, del cazo y del enganche.

● Lubrique el bulón de unión de la pluma y el balancín.

● Compruebe y ajuste la oruga.

● Limpie el filtro de aire.

● Cambie el aceite del motor por primera vez.

● Cambie el filtro de aceite de motor por primera vez.

● Cambie el prefiltro de combustible por primera vez.

● Cambie el filtro de combustible por primera vez.

Cada 100 horas de servicio o dos semanas

Además de todas las comprobaciones de servicio anteriores:

● Lubrique el bulón de elevación y del pie de pluma.

● Lubrique el bulón del pistón y el bulón inferior del cilindro del brazo.

● Lubrique el bulón inferior del cilindro del cazo.

● Compruebe y ajuste la tensión de la correa del ventilador.

● Compruebe y ajuste la tensión de la correa del compresor.

Cada 250 horas de servicio o cada mes

Además de todas las comprobaciones de servicio anteriores:

● Compruebe el nivel de aceite del engranaje del reductor de giro.

● Compruebe el nivel de aceite del engranaje del reductor de

desplazamiento.

● Compruebe que los tornillos y tuercas estén apretados.

● Compruebe el sistema de admisión de aire del motor.

● Compruebe la tensión y el estado de la correa del motor y del compresor.

● Compruebe el nivel de gas refrigerante.

● Limpie el filtro anti polen y el filtro de recirculación de aire de la cabina.

Cada 500 horas de servicio o tres meses

Además de todas las comprobaciones de servicio anteriores:

● Lubrique el cojinete de giro.

● Lubrique el engranaje de giro.

● Limpie la superficie de los radiadores.

●Cambie los componentes internos y externos del filtro de aire.

● Sustituya el aceite del engranaje del reductor de traslación por primera vez (sustitúyalo cada 1000 horas posteriormente).

● Sustituya el aceite del engranaje del reductor de giro por primera vez (sustitúyalo cada 1000 horas posteriormente).

● Limpie la superficie del condensador.

● Cambie el aceite del motor.

● Cambie el filtro del aceite de motor.

● Cambie el prefiltro de combustible.

● Cambie el filtro de combustible.

● Cambie el filtro de retorno del tapón del respiradero.

Cada 1000 horas de servicio o seis meses

Además de todas las comprobaciones de servicio anteriores:

● Ajuste el juego de válvulas del motor.

● Limpie el filtro de la bomba de combustible.

● Sustituya el aceite del engranaje del reductor de giro.

● Sustituya el aceite del engranaje del reductor de desplazamiento.

● Sustituya el filtro del aceite de pilotaje.

● Sustituya el filtro de retorno del depósito de aceite hidráulico.

● Lubrique el cojinete del engranaje del reductor de giro.

Cada 2000 horas de servicio o cada año

Además de todas las comprobaciones de servicio anteriores:

● Sustituya el aceite hidráulico.

● Sustituya el filtro de aspiración del depósito de aceite hidráulico.

● Sustituya el filtro de aspiración de combustible.

● Sustituya el líquido refrigerante y limpie la superficie interna del radiador.

● Compruebe la manguera de

refrigeración del aire acondicionado y la manguera de agua para detectar grietas, desgaste y formación de espuma por contaminantes del aceite. Compruebe que la junta y la abrazadera no estén sueltas.

● Sustituya el filtro de recirculación de aire de la cabina.

Cada 4500 horas de servicio o 3 años

● Sustituya el filtro de postratamiento de la unidad de dosificación de AdBlue.